

# Vishnu Kadiyala

Machine Learning Engineer | Multi-Agent Reinforcement Learning | Autonomous Systems  
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## Summary

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Machine learning researcher and Ph.D. candidate specializing in multi-agent reinforcement learning, transformer architectures, and decision-making under partial observability. Experienced building end-to-end deep learning systems on real-world datasets including satellite, radar, and vision-based sensing. Interested in applying MARL and reinforcement learning to autonomous driving, robotics, and multi-agent decision systems.

## Core Skills

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**Languages:** Python, MATLAB

**ML/RL:** Deep Learning, Transformers, CNNs, Diffusion Models, Multi-Agent RL

**Frameworks:** TensorFlow, Keras

**Data & Systems:** Pandas, Xarray, NetCDF, HPC/SLURM, Linux

**Concepts:** Partial Observability, Policy Learning, Sensor Fusion, Spatio-temporal Modeling

## Experience

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### Graduate Researcher — NSF AI2ES

Jan 2024 – Present

- Designed transformer-based models for learning latent representations from irregularly sampled environmental data.
- Achieved **13× improvement** over classical rainfall estimation models using parameter-efficient neural architectures.
- Built vision-based atmospheric visibility estimation system using distributed camera data.
- Developed scalable ML pipelines for large environmental datasets on HPC infrastructure.

### Graduate Researcher — NASA GeoCARB

Jan 2021 – May 2023

- Developed U-Net model achieving **95% accuracy** for methane hotspot detection using satellite imagery.
- Built anomaly detection system improving performance from **80% to 90.2%**.
- Performed geospatial analysis identifying emissions exceeding regulatory estimates.

### Autonomous Systems & Multi-Agent RL Research (PhD)

- Developing belief-based coordination framework for decentralized agents without explicit communication.
- Designing attention-based latent belief models for cooperative multi-agent environments.
- Investigating coordination emergence under partial observability.

## Projects

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- Transformer-based spatio-temporal learning for irregular sensor data.
- Deep learning pipeline for document structure recognition (99% accuracy).
- Multi-agent reinforcement learning research targeting autonomous driving applications.

## Publications (Selected)

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- Estimating Statewide Atmospheric Visibility From Camera Images — AMS 2025
- Carbon-Based Pollutant Monitoring during GeoCarb-TRACER — AMS 2024
- Localization of Tables and Plots in Documents Using Deep Neural Networks (Master's Thesis)

## Education

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Ph.D. Computer Science (Expected 2027) — University of Oklahoma

M.S. Electrical & Computer Engineering — University of Oklahoma

B.E. Electronics & Communication Engineering — KLE Technological University